

Development Of Mega Buana Hospital Management Information System (Simrs)

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ABSTRACT

The Hospital Management Information System (SIMRS) is a technology-driven solution designed to enhance healthcare service efficiency by optimizing patient data management and expediting hospital administrative processes. This article discusses the development of SIMRS at Mega Buana Hospital by employing a user-based needs approach and integrating the latest technology to ensure optimal functionality for medical personnel and administrative staff. This research utilizes a needs analysis method, system development following the SDLC (System Development Life Cycle) model, including design, implementation, and system performance evaluation. The results indicate that SIMRS significantly improves hospital operational efficiency, minimizes administrative errors in patient data and medical record management, and accelerates patient services across various hospital units.



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Keywords:

Hospital Information System, Hospital Management, SIMRS, SDLC, Service Efficiency.

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INTRODUCTION

The development of information technology has had a significant impact on various sectors, including healthcare. Digitalization in the medical field has become essential to ensure faster, more efficient, and well-organized services[1]. Hospitals, as healthcare providers, have complex information management needs, covering patient data, administration, electronic medical records, and overall hospital operations. The use of integrated technology is a key factor in improving hospital performance and service effectiveness. One solution to address these challenges is the Hospital Management Information System (SIMRS). With this system, various hospital operational aspects can be managed more effectively, reducing the risk of errors in patient data recording and speeding up administrative and healthcare service processes. SIMRS allows medical personnel and administrative staff to work more optimally, ultimately improving the quality of patient care[2].

Mega Buana Hospital, as a case study in this research, faces several challenges in information management, such as manual administrative processes, which lead to inefficiencies in patient data recording and medical information processing. Additionally, the lack of centralized data storage makes it difficult for medical and administrative staff to access information. This can result in delays in medical decision-making and overall hospital

operations. Therefore, developing a SIMRS is a crucial solution to enhance hospital operational efficiency, accelerate information access, and support more accurate and data-driven decision-making[3].

METHODS

The development of SIMRS follows a series of stages based on the SDLC model, ensuring that each process is carried out systematically and structured[4].

Problem Identification

At this stage, a hospital needs analysis is conducted to understand the information system required to enhance healthcare services. This process involves interviews with medical personnel and administrative staff to identify challenges in patient data management and administrative processes. Additionally, a literature review is carried out to understand best practices in the implementation of SIMRS.



Figure 1. Problem Identification Flowchart for SIMRS Implementation

Figure 1 illustrates the process of SIMRS Analysis and Design at Mega Buana Palopo Hospital. The SIMRS needs analysis is carried out through five main stages:

1. Hospital Needs Analysis – Identifying the current manual system and inefficiencies in patient data recording and management.
2. Interviews with Medical Personnel and Staff – Exploring challenges in information management, such as delays in accessing medical records and lack of system integration across hospital units.

3. Identifying Key Issues - Highlighting major problems, including patient data duplication, service delays due to manual recording, and lack of interoperability between systems.
4. Literature Review on Best Practices for SIMRS - Exploring successful SIMRS implementations with key features such as electronic medical records, digital queue systems, and integrated hospital services.
5. Analysis Results and Recommendations - Developing an integrated SIMRS solution with a centralized patient database, digital registration system, and encrypted data security to enhance hospital service efficiency and accuracy

System Design

After identifying the requirements, the next stage is system design. This process includes system architecture design, creating workflow diagrams (flowcharts), and database design to ensure efficiency in data management[5]. The database structure is built with accessibility and security needs in mind[6].

Table 1. SIMRS Database Structure

No	Table Name	Description
1	Patient	Stores basic patient information, including name, date of birth, address, and basic medical history.
2	Medical_Records	Contains patient medical records, including examination results, doctor diagnoses, and treatments provided.
3	Medication	Used to manage hospital drug inventory, recording stock availability, drug types, and prescription details.

Table 1 describes the main database structure in SIMRS. The Patient table stores patient identity information, Medical_Record records medical history and treatments, while Medicine manages stock and prescription details. This structure ensures efficient and integrated data management.

Implementation

The system implementation involves the development of web-based software accessible to medical personnel and administrative staff[7]. The technology used takes into account scalability and data security aspects. At this stage, key modules such as patient registration, electronic medical records, pharmacy, and payment are developed and tested to ensure their functionality[8].

User Interaction

The Hospital Management Information System (SIMRS) is designed to manage various aspects of hospital operations in an integrated manner. The following is the user interaction flow illustrated in Figure 2

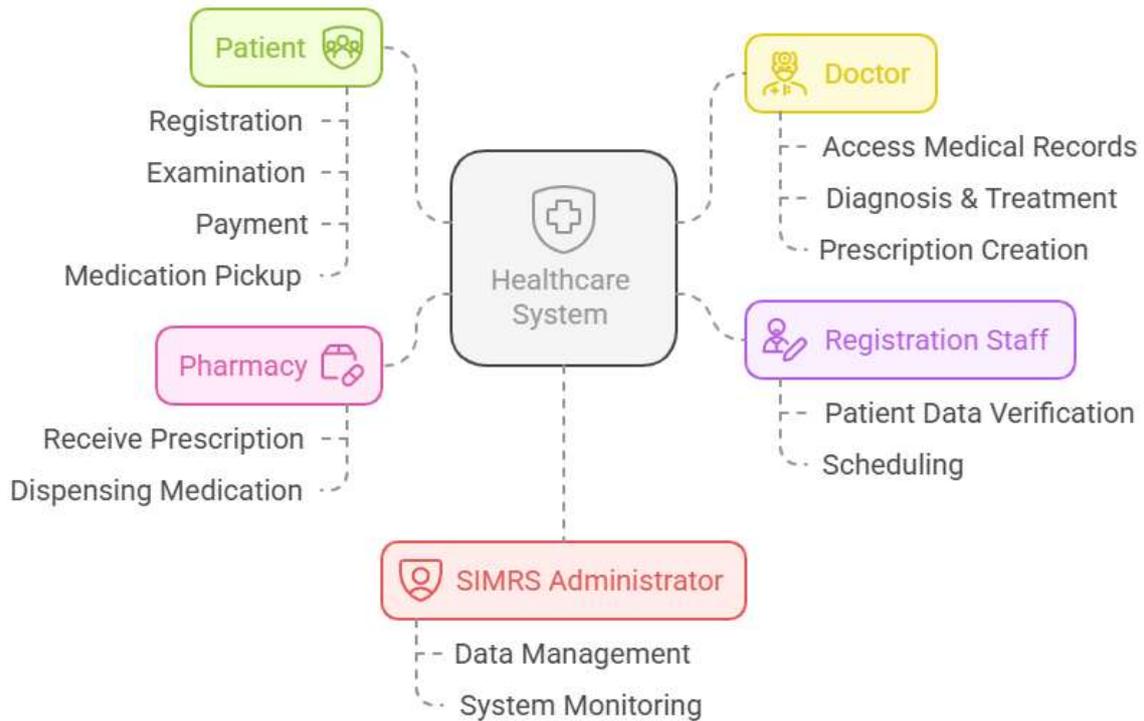


Figure 2. System User Interaction Flowchart

Database Interaction

Hospital Management Information System (SIMRS) is an integrated system designed to manage hospital operations, including patient administration, electronic medical records, pharmacy, finance, and human resource management [9]. Database interaction in SIMRS is crucial for storing, processing, and retrieving data efficiently and securely.



Figure 3. System Database Interaction

Figure 3 illustrates a centralized database system that integrates key hospital modules to ensure data accuracy and efficiency. The Patient Registration System records patient identity and medical history, while the Electronic Medical Record (EMR) Updates store examination and treatment data in real-time. The Pharmacy System manages prescriptions and drug inventory, whereas the Billing System synchronizes patient services with financial administration. With interconnected systems, hospital operations become more effective and transparent.

System Testing

After the system is implemented, testing is conducted using the black-box method to

ensure that each feature functions according to the specified requirements[10]. End-user testing is also performed by medical personnel and administrative staff to gather feedback and improve the system if any issues are identified[11].



Figure 4. SIMRS Implementation and Testing Sequence

Evaluation and Maintenance

After the system is implemented, periodic evaluations are conducted to identify issues and ensure optimal system performance[12].

Table 2. System Performance Evaluation

Aspect	Evaluation Criteria	Results
System Speed	Response time for data retrieval	Fast
Data Security	Protection against unauthorized access	Secure
User Experience	Satisfaction level from staff and patients	High
Error Reduction	Decrease in administrative errors	Significant

This evaluation covers system speed, data security, and user experience. The results are used for maintenance and the development of additional features based on the hospital's needs[13].

RESULTS AND DISCUSSION

To provide a clearer understanding of the impact of SIMRS, the table below highlights significant improvements observed after its implementation, demonstrating enhanced efficiency and effectiveness in hospital operations.

Table 3. Impact of SIMRS Implementation

Aspect	Before SIMRS Implementation	After SIMRS Implementation
Patient Registration	Manual and time-consuming	Automated and efficient
Medical Record Access	Difficult and slow	Fast and real-time
Error Rate in Data	High	Significantly reduced
Patient Waiting Time	Long	Shorter and more efficient

The implementation of SIMRS at Mega Buana Hospital has resulted in significant improvements in operational efficiency.

Table 4. Administrative Workflow Efficiency

Workflow Aspect	Before SIMRS	After SIMRS
Registration Time	30 minutes	5 minutes
Data Processing	Slow	Real-time
Staff Workload	High	Reduced

Table 5. Data Accuracy and Security

Data Issue	Before SIMRS	After SIMRS
Incorrect Entries	High	Minimal
Missing Records	Frequent	Rare
Unauthorized Access	Possible	Secured

Table 6. Patient Experience Metrics

Satisfaction Aspect	Before SIMRS	After SIMRS
Waiting Time	45 minutes	10 minutes
Service Rating	3.5/5	4.8/5
Complaints	High	Low

Additionally, user feedback indicates increased satisfaction among hospital staff and patients due to the system's ease of use and efficiency. The system has streamlined administrative tasks, reducing the burden on medical personnel and allowing them to focus more on patient care. The integration of digital records has also improved interdepartmental communication, ensuring better coordination and faster decision-making. These enhancements contribute to overall hospital efficiency and improved service quality.

CONCLUSION

Based on the research findings and system implementation, the development of SIMRS at Mega Buana Hospital has had a positive impact on operational efficiency and healthcare service quality. The integrated system allows hospitals to manage information more effectively

and improve patient services. Future developments may include the addition of features such as an online appointment system and AI-driven data analysis for enhanced decision-making.

Continuous evaluation and refinement of the system are necessary to adapt to the evolving needs of the hospital and ensure sustained efficiency and security.

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